

Discuss and take appropriate action on restricting or eliminating use of herbicide HYVAR.

Moved: Judge Doerfler

Seconded: Commissioner Boatright

Motion: To eliminate the use of HYVAR except what is left in stock to be used on railroad right-of-way only.

Vote: Motion failed 2 - 2 with Commissioner Heiligenstein and Commissioner Mehevec voting against the motion.

< Clerk copy here >

November 3, 1998

**HERBICIDES CURRENTLY IN USE BY U.R.S.:**

- 1) **Plateau** - Plateau is used as a foliage spray primarily to control Johnson grass and to promote Bermuda grass release. This product is not a sterilant.
- 2) **Arsenal** - Arsenal is a foliage spray used to control Johnson grass, Bermuda grass and Georgia Cane. It is applied to the edge of the pavement to prevent damage by encroaching plant growth. This product is not a sterilant.
- 3) **Garlon 3A** - Garlon 3A is a contact spray used to control broadleaf weeds and trees. It is not a sterilant.
- 4) **Tardon 101** - Tardon 101 is a contact spray used to control broadleaf weeds and trees. It is not a sterilant.
- 5) **Round-Up Pro** - Round-Up Pro is used to control Johnson grass. It is not a sterilant.
- 6) **Hyvar YL** - Hyvar YL is a sterilant used to control trees in certain areas where desirable trees are not present. Hyvar YL is the only product used by U.R.S. that is a sterilant, the others are contact sprays that effect only the portion of the plant or trees sprayed, with minimum residual effects.



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AMERICAN CYANAMID CO.  
WAYNE, NJ 07470

MATERIAL SAFETY DATA SHEET

MSDS NO. AG09168-2  
CAS NO. 104098-48-8

DATE: SEP 06, 1995

EMERGENCY TELEPHONE: (201)-835-3100 (U.S.A.)

PRODUCT IDENTIFICATION	TRADE NAME: PLATEAU™ 2 ASU		
	SYNONYMS: Ammonium salt of 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-methyl-3-pyridine carboxylic acid; AC 263,222 2ASU; CL 263,222 2ASU,		
	CONTEND		
	CHEMICAL FAMILY: Not Applicable		
	MOLECULAR FORMULA: C <sub>14</sub> H <sub>16</sub> N <sub>3</sub> O <sub>3</sub> .NH <sub>4</sub>		
WARNING STATEMENTS	MOLECULAR WEIGHT: 292.000		
	USAGE: Herbicide		
	CAUTION: Keep out of reach of children and away from all forms of food.		
INGREDIENTS	COMPONENT	CAS. NO.	%
	AC263,222	104098-48-8	22.20
	Inerts		77.80
	REFERENCE: AC263,222		None
	Inerts		None
PHYSICAL PROPERTIES	APPEARANCE AND ODOR:	Clear liquid, pale yellow to green color	
	BOILING POINT:	Not Applicable	
	MELTING POINT:	Liquid at room temperature	
	VAPOR PRESSURE:	Not Available	
	SPECIFIC GRAVITY:	1.07 - 1.09 g/mL	
	VAPOR DENSITY:	Not Applicable	
	% VOLATILITY (BY VOL.):	~ 65% as water	
	PH:	6.4 - 7.0	
	SATURATION IN AIR (BY VOL.):	Not Applicable	
	SOLUBILITY IN WATER:	Miscible	

**FIRE AND  
EXPLOSION  
HAZARD  
INFORMATION**

FLASH POINT: > 200°F  
AUTOIGNITION TEMP: Not Available  
DECOMPOSITION TEMP: Not Available

FIRE CONTROL TACTICS:

Wear self-contained, positive pressure breathing apparatus and full fire fighting protective clothing.

Keep unnecessary people away. Use as little water as possible. Dike area of fire to prevent material run-off. Use spray or fog - solid stream may cause spreading.

Do not decontaminate personnel or equipment, or handle broken packages or containers without protective equipment as specified in the Exposure Control Section. Decontaminate emergency personnel with soap and water before leaving the fire area.

Avoid breathing dusts, vapors and fumes from burning materials. Control run-off water - if water enters a drainage system, advise the authorities downstream.

FIRE EXTINGUISHING MEDIA:

Use water, foam, dry chemical, or carbon dioxide to extinguish fires.

**NFPA HAZARD  
RATING**

NFPA Rating Not Assigned

**REACTIVITY DATA**

STABILITY: Stable  
POLYMERIZATION: Will not occur  
INCOMPATIBLE MATERIALS: Corrosive to zinc, iron, mild steel  
HAZARDOUS DECOMPOSITION PRODUCTS: Combustion may produce oxides of carbon and nitrogen

**HEALTH HAZARD  
INFORMATION**TOXICITY DATA AND  
EFFECTS OF OVEREXPOSURE:ACUTE TOXICITY DATA:

The acute oral LD<sub>50</sub> in rats for the combined sexes was shown to be greater than 5000 mg/kg b.w., indicating that the product is relatively non-toxic by ingestion in single doses.

The acute dermal LD<sub>50</sub> in rabbits for the combined sexes was found to be greater than 5000 mg/kg b.w., indicating that the material is relatively non-toxic by skin contact in single doses.

Appropriate primary eye and skin assays indicate that the product is non-irritating to rabbit eyes and/or skin.

This material has an acute inhalation LC<sub>50</sub>

(cont from pg. 2) greater than 2.38 mg/l (analytical) of air over a 4 hour exposure period in rats.

The product was shown not to be a primary skin irritant or skin sensitizer in albino guinea pigs when employing the method as described by Buehler.

**EMERGENCY AND FIRST AID PROCEDURES:**

**IF SWALLOWED:** Drink large quantities of water. Induce vomiting by touching back of throat with fingers.

**IF IN EYES:** Flush eyes with large amounts of water. Seek medical attention if irritation occurs.

**IF ON SKIN:** Wash skin with soap and water. Seek medical attention if irritation occurs.

**IF INHALED:** If exposure is excessive, remove to fresh air.

**EXPOSURE  
CONTROL METHODS**

Provide adequate ventilation when handling. Wear a NIOSH-approved respirator, rubber gloves, goggles, and protective clothing when handling.

Remove contaminated clothing. Launder clothing prior to reuse. Shower after completion of work shift.

Wash hands with soap and water before eating, smoking or using the toilet.

**SPILL OR LEAK  
PROCEDURES**

Wear appropriate protective clothing and personal protective equipment. (See "Exposure Control".)

Keep away from drains, surface and ground water, and soil.

Dike spill area to prevent spill from spreading. Absorb the spilled material with an inert absorbent such as granular clay or sawdust. Shovel or sweep the absorbed spill into covered containers for proper disposal. (See "Waste Disposal".) Do not use containers of zinc, iron or mild steel.

Rinse the spill area and any tools or implements several times with soapy water. Contain and absorb this rinsate with inert absorbents and place into the same disposal container as the spilled material.

Spills to the soil can be shoveled directly into covered containers for disposal. If the spill occurred to a body of water, immediately notify the appropriate authorities downstream of the spill so that they can decide what if any further action is needed.

Depending on local spill reporting requirements and the

(cont from pg. 3) amount released, it may be necessary to notify the regulatory authorities.

**WASTE DISPOSAL:** To avoid disposal, all attempts should be made to use this product completely, in accordance with its registered use. If this is not possible, handle with care, and dispose in a safe manner.

Empty containers or liners may retain some product residues. DO NOT REUSE. Rinse the container or liner as needed for disposal. Render it unusable by crushing or puncturing. Dispose of the container and any rinsate in a safe manner.

Follow all applicable community, national or regional regulations regarding waste management methods.

**SPECIAL  
PRECAUTIONS**

**HANDLING AND STORAGE:**

Do not contaminate water, food, or feed by storage or disposal. Store in a secure, dry, well-ventilated, separate room, building or covered area.

Not for use or storage in or around the home.

Keep away from sources of ignition and protect from exposure to fire and heat.

Segregate from oxidizers and incompatible materials listed in the Reactivity Data Section.

**APPENDIX**

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assume legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE.

**SOURCE AND** SHEET NO.: AG09168-2  
**DATE INFORMATION** DATE: SEP 06, 1995

 **CYANAMID**  
American Cyanamid Company  
North America Agricultural Products Division  
Specialty Products Department  
Parsippany, NJ 07054

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910 0010

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AMERICAN CYANAMID CO.  
PARSIPPANY, NJ 07054

MSDS NO. AG09107-3  
CAS NO. Mixture

## MATERIAL SAFETY DATA SHEET

DATE: MAR 16, 1993

EMERGENCY TELEPHONE: (201)-835-3100 (U.S.A.)

PRODUCT IDENTIFICATION	TRADE NAME: ARSENAL® Herbicide		
	SYNONYMS: Imazapyr, isopropylamine salt. 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nicotinic acid, salt with isopropylamine (1:1) 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid, salt with 2-propanamine (1:1); ARSENAL NS Herbicide; AC252.925; CL252.925		
	CHEMICAL FAMILY: Imidazolinone		
	MOLECULAR FORMULA: C <sub>13</sub> H <sub>15</sub> N <sub>3</sub> O <sub>3</sub> .C <sub>3</sub> H <sub>7</sub> N		
	MOLECULAR WEIGHT: 323.400		
	USAGE: Herbicide		
WARNING STATEMENTS	CAUTION! Keep out of reach of children. Avoid contact with eyes, skin, or clothing. Avoid breathing spray mist.		
INGREDIENTS	COMPONENT	CAS. NO.	%
	Inerts		71.30
	Isopropylamine	081510-83-0	28.70
	Salt of Imazapyr		
	REFERENCE: Inerts		None
	Isopropylamine Salt of Imazapyr		None
PHYSICAL PROPERTIES	APPEARANCE AND ODOR:	Clear blue liquid; slight ammonium odor.	
	BOILING POINT:	Not available	
	MELTING POINT:	Not applicable	
	VAPOR PRESSURE:	Not available	
	SPECIFIC GRAVITY:	1.04 - 1.07	
	VAPOR DENSITY:	Not available	
	% VOLATILITY (BY VOL.):	71	
	OCTANOL / H <sub>2</sub> O	1.3 for the active ingredient at 22°C	
	PARTITION COEF.:		
	PH:	6.6 - 7.2	

(cont from pg. 1) SATURATION IN AIR (BY VOL.): Not available  
EVAPORATION RATE: Not available  
SOLUBILITY IN WATER: Soluble

**FIRE AND  
EXPLOSION  
HAZARD  
INFORMATION**

FLASH POINT: > 98.9°C (210°F) - SETA  
Closed Cup  
FLAMMABLE LIMITS (% BY VOL.): Not applicable  
AUTOIGNITION TEMP: > 93°C (200°F)  
DECOMPOSITION TEMP: Not available

**FIRE EXTINGUISHING MEDIA:**

Use water, alcohol foam, dry chemical or carbon dioxide to extinguish fires.

**FIRE CONTROL TACTICS:**

Wear self-contained, positive pressure breathing apparatus and full fire fighting protective clothing.

Keep unnecessary people away. Use as little water as possible. Dike area of fire to prevent pesticide run-off. Use spray or fog - solid stream may cause spreading.

Do not decontaminate personnel or equipment, or handle broken packages or containers without protective equipment as specified in the Exposure Control Section. Decontaminate emergency personnel with soap and water before leaving the fire area.

Avoid breathing dusts, vapors and fumes from burning materials. Control run-off water - if water enters a drainage system, advise the authorities downstream.

**NFPA HAZARD  
RATING**

(As Recommended by American Cyanamid Co.)

0 Least	1	Flammability
1 Slight	/ \	
2 Moderate	1 0	Health Reactivity
3 High	\ /	
4 Severe		Special

**REACTIVITY DATA**

STABILITY: Stable  
POLYMERIZATION: Will not occur  
INCOMPATIBLE: Strong oxidizing and reducing agents.  
MATERIALS: Corrosive to mild steel and brass.  
HAZARDOUS: Combustion may produce oxides of  
DECOMPOSITION: carbon and nitrogen.  
PRODUCTS:

**HEALTH HAZARD  
INFORMATION**

TOXICITY DATA AND  
EFFECTS OF OVEREXPOSURE:

(cont from pg. 2) ACUTE TOXICITY DATA:

Toxicological data on this particular formulation is not available. However, data from a similar formulation product have shown the following;

The acute oral LD<sub>50</sub> for both male and female albino rats is greater than 5000 mg/kg indicating that this material is no more than slightly toxic if ingested.

The acute dermal LD<sub>50</sub> for both male and female albino rabbits is greater than 2148 mg/kg indicating that this material is no more than slightly toxic by single skin applications.

This formulation may be irritating to the rabbit eye and mildly irritating to the rabbit skin.

CHRONIC TOXICITY DATA:

Mutagenicity: No mutagenic activity was observed in ARSENAL Technical (Imazapyr) by all test methods used. These included unscheduled DNA Synthesis Rat Hepatocyte Assay, in vitro Chinese Hamster Ovary (CHO)/Hypoxanthine Guanine Phosphoriboxyl Transferase (HGPRT) Mutation Assay, Bacterial/Microsome Reverse Mutation (Ames) Test and in vitro Chromosomal Aberrations in Chinese Hamster Ovary Cells.

Teratogenicity: No teratogenic or fetotoxic effects were found at all dose levels tested in mice and rats.

Imazapyr is not listed as a human carcinogen by the IARC, OSHA or NTP.

Isopropylamine salt present in this formulation is not listed as a human carcinogen by the IARC, OSHA or NTP.

EMERGENCY AND FIRST AID PROCEDURES:

IF ON SKIN: Wash skin with plenty of soap and water. Get medical attention if irritation persists.

IF IN EYES: Flush eyes with plenty of water. Get medical attention if irritation persists.

IF SWALLOWED: Drink two glasses of water, induce vomiting if the person is conscious. Obtain medical attention promptly.

IF INHALED: Remove subject to fresh air.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

RECORDERS MEMORANDUM

All or parts of the text on this page was not clearly legible for satisfactory recordation.

(cont from pg. 3) MEDICAL CONDITION AGGRAVATED BY OVEREXPOSURE:  
A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

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**EXPOSURE  
CONTROL METHODS** During formulation of this product, use the following recommended industrial hygiene practices:

Wear chemical splash goggles to prevent contact with the skin. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

For end-users, refer to product label for personal protective clothing/equipment if required.

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**SPILL OR LEAK  
PROCEDURES** Wear appropriate protective clothing and personal protective equipment. (See "Exposure Control".)

Keep away from drains, surface and ground water, and soil.

Dike spill area to prevent spill from spreading. Absorb the spilled material with an inert absorbent such as granular clay or sawdust. Shovel or sweep the absorbed spill into covered containers for proper disposal. (See "Waste Disposal".)

Rinse the spill area and any tools or implements several times with soapy water. Contain and absorb this rinsate with inert absorbents and place into the same disposal container as the spilled material.

Small spills to the soil can be shoveled directly into covered containers for disposal. In the event of a large spill, contact American Cyanamid for guidance on available clean-up options. Depending on the amount released to the environment, it may be necessary to notify the regulatory authorities.

If the spill occurred to a body of water, immediately notify the appropriate authorities downstream of the spill so that they can decide what if any further action is needed.

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**WASTE DISPOSAL:** To avoid disposal, all attempts should be made to use this product completely, in accordance with its registered use. If this is not possible, handle with care, and dispose in a safe manner.

Follow all applicable community, national or regional regulations regarding waste management methods.

Empty containers or liners may retain some

(cont from pg. 4)

product residues. DO NOT REUSE. Triple rinse the container or liner thoroughly and render it unusable by crushing or puncturing. Dispose of both the container and the rinsate in a safe manner.

It is the ultimate responsibility of the waste generator to determine at the time of disposal whether this product and/or "empty" container residue meets any hazardous waste criteria.

**SPECIAL  
PRECAUTIONS****HANDLING AND STORAGE:**

Do not contaminate water, food, or feed by storage or disposal. Store in a secure, dry, well-ventilated, separate room, building or covered area.

Not for use or storage in or around the home.

Keep away from sources of ignition and protect from exposure to fire and heat.

Segregate from oxidizers and incompatible materials listed in the Reactivity Data Section.

**ADDITIONAL REGULATORY INFORMATION****SARA Title III Data****Section 311 and 312 Hazard Categories**

Immediate Health Hazard -	<u>Y</u>	Reactive Hazard -	<u>N</u>
Delayed Health Hazard -	<u>N</u>	Sudden Pressure Release Hazard -	<u>N</u>
Fire Hazard -	<u>N</u>		

**Section 302 Extremely Hazardous Substances -** None

**Section 313 Toxic Chemicals -** None

**CERCLA Reportable Quantity**

ARSENAL® Herbicide - None known.

**RCRA Hazardous Waste Code(s) And Statement(s)**

ARSENAL® Herbicide - None known.

It is the responsibility of the waste generator to determine if any hazardous waste code(s) apply, prior to disposal.

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**APPENDIX**

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SOURCE AND	SHEET NO.:	AG09107-3
DATE INFORMATION	DATE:	MAR 16, 1993

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American Cyanamid Company  
Agricultural Products Division  
Specialty Products Department  
One Campus Drive  
Parsippany, NJ 07054

## ACTIVE INGREDIENT IN ARSENAL® & STALKER™ FOUND TO BE NON-CARCINOGENIC

### EPA Classifies Imazapyr as "Group E" Compound

The Environmental Protection Agency (EPA) recently confirmed that imazapyr, the active ingredient in ARSENAL® and STALKER™ herbicides, shows no evidence of carcinogenicity. The EPA classified imazapyr as a Group E compound, the designation for products exhibiting no evidence of carcinogenicity in at least two adequate animal tests in different species.

Imazapyr is one of a new generation of herbicides discovered by American Cyanamid Company. Imazapyr-based herbicides applied at low volumes selectively control unwanted brush, while promoting the growth of plants and flowers favored by wildlife. Because the products are effective at very low rates, they conform with the Environmental Stewardship Strategy for Electric Utility Rights-of-Way by reducing chemical load on the environment.

Imazapyr works by inhibiting an enzyme that is essential for the growth of plants. This enzyme is not present in humans, animals, birds or fish, and extensive toxicological testing on these species showed that imazapyr is not harmful when applied at labeled rates.

For more information on ARSENAL, STALKER, or Project Habitat,  
call 1-800-545-9525.



®/™ Trademark, American Cyanamid Company

# MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.\* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 38321

Page: 1

Product Name: GARLON (R) 3A HERBICIDE

Effective Date: 06/08/90 Date Printed: 06/13/90

MSDS:000639

## 1. INGREDIENTS: (% w/w, unless otherwise noted)

Triclopyr (3,5,6-trichloro-2-pyridinyloxyacetic acid), as the triethylamine salt	CAS# 057213-69-1	44.4%
Other ingredients, including:		55.6%
Water	CAS# 007732-18-5	
Proprietary emulsifiers and surfactants		
Ethanol (1%)	CAS# 000064-17-5	

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not hazardous under this OSHA Standard may be listed. Where proprietary ingredient shows, the identity is not available as provided in this standard.

## 2. PHYSICAL DATA:

BOILING POINT: Not determined.  
 VAP PRESS: Not determined.  
 VAP DENSITY: Not applicable  
 SOL. IN WATER: High  
 SP. GRAVITY: 1.135 (68/68F)  
 APPEARANCE: Amber liquid.  
 ODOR: Not available.

## 3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 110F, 43C  
 METHOD USED: TCC

FLAMMABLE LIMITS  
 LFL: Not determined  
 UFL: Not determined

EXTINGUISHING MEDIA: Alcohol foam and CO2.

(Continued on Page 2)

(R) Indicates a Trademark of The Dow Chemical Company

\* An Operating Unit of The Dow Chemical Company

### RECORDERS MEMORANDUM

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**MATERIAL SAFETY DATA SHEET**

Dow Chemical U.S.A.\* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 38321

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Product Name: GARLON (R) 3A HERBICIDE

Effective Date: 06/08/90 Date Printed: 06/13/90

MSDS:000639

**3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)**

FIRE & EXPLOSION HAZARDS: Irritating vapors under fire conditions.

FIRE-FIGHTING EQUIPMENT: Use positive pressure self-contained breathing equipment.

**4. REACTIVITY DATA:**

STABILITY: (CONDITIONS TO AVOID) Combustible. Avoid sources of ignition if temperature is near or above flash point.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Any oxidizing agent. Consult manufacturer for specific cases.

HAZARDOUS DECOMPOSITION PRODUCTS: Irritating vapors under fire conditions.

HAZARDOUS POLYMERIZATION: Will not occur.

**5. ENVIRONMENTAL AND DISPOSAL INFORMATION:**

ACTION TO TAKE FOR SPILLS/LEAKS: Dike large spills. Keep out of streams and domestic water supplies. Absorb small spills in inert material such as sand.

DISPOSAL METHOD: In case of large spills, contact The Dow Chemical Company. Bury clean-up material from small spills in non-crop area away from water supplies, in accordance with local, state, and federal regulations.

**6. HEALTH HAZARD DATA:**

(Continued on Page 3)

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MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.\* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 38321

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Product Name: GARLON (R) 3A HERBICIDE

Effective Date: 06/08/90 Date Printed: 06/13/90

MSDS:000639

6. HEALTH HAZARD DATA:

EYE: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. When tested on animals, dilutions of this material were less irritating to eyes than the undiluted product.

SKIN CONTACT: Prolonged or repeated exposure may cause skin irritation, even a burn. When tested on animals, dilutions of this material were less irritating to skin than the undiluted product.

SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The LD50 for skin absorption in rabbits is >3980 mg/kg.

INGESTION: Single dose oral toxicity is low. The oral LD50 was 2574 mg/kg for male rats and 1847 mg/kg for female rats. Amounts ingested incidental to industrial handling are not likely to cause injury; however, ingestion of larger amounts may cause injury. Ingestion may cause gastrointestinal irritation or ulceration.

INHALATION: Based on animal data, short, single exposures to this formulation should pose no acute inhalation hazard. The only volatile component of the formulation is a small amount of ethanol.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:

Excessive exposure may cause liver or kidney effects. Ethanol, a minor component, has caused CNS and liver effects.

CANCER INFORMATION:

The active ingredient did not cause cancer in long-term animal studies. Available data on ethanol are inadequate to evaluate carcinogenicity.

TERATOLOGY (BIRTH DEFECTS):

For the active ingredient, birth defects are unlikely. Even

(Continued on Page 4)

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**M A T E R I A L   S A F E T Y   D A T A   S H E E T**

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**Dow Chemical U.S.A.\*   Midland, MI 48674   Emergency Phone: 517-636-4400**

Product Code: 38321

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**Product Name: GARLON (R) 3A HERBICIDE**

Effective Date: 06/08/90   Date Printed: 06/13/90

MSDS:000639

**6. HEALTH HAZARD DATA: (CONTINUED)**

exposures having an adverse effect on the mother should have no effect on the fetus. Ethanol has caused birth defects in laboratory animals. Ethanol has also been toxic to the fetus in laboratory animal tests. Ethanol has been shown to cause human fetotoxicity and/or birth defects when ingested during pregnancy.

**REPRODUCTIVE EFFECTS:**

In animal studies, triclopyr has been shown not to interfere with reproduction. Ethanol, a minor component, has produced some adverse effects on male fertility in laboratory animals and humans.

**MUTAGENICITY (EFFECTS ON GENETIC MATERIAL):**

Results of in vitro ('test tube') mutagenicity tests have been negative for both triclopyr and ethanol. Results of mutagenicity tests in animals have been negative for triclopyr. Ethanol has been shown to be negative in some animal mutagenicity tests and positive in others. Ethanol is not believed to be a direct acting mutagen.

**7. FIRST AID:**

**EYES:** Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

**SKIN:** Wash off in flowing water or shower. Clothing: Remove contaminated clothing and wash before reuse.

**INGESTION:** Do not induce vomiting. Give large amounts of water or milk if available and transport to medical facility.

**INHALATION:** No adverse effects anticipated by this route of exposure.

**NOTE TO PHYSICIAN:** If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care.

(Continued on Page 5)

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# MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.\* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 38321

Page: 5

Product Name: GARLON (R) 3A HERBICIDE

Effective Date: 06/08/90 Date Printed: 06/13/90

MSDS:000639

## 7. FIRST AID: (CONTINUED)

Treatment based on judgment of the physician in response to reactions of the patient.

## 8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): Ethanol (ethyl alcohol): ACGIH TLV and OSHA PEL are 1000 ppm. 3,5,6-Trichloro-2-pyridyloxyacetic acid (Triclopyr), triethylamine salt: Dow IHG is 4 mg/m<sup>3</sup> as acid equivalent, skin.

VENTILATION: Control airborne concentrations below the exposure guideline. Good general ventilation sufficient for most conditions. Local exhaust ventilation may be necessary for some operations.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for handling the concentrate under certain operations, use a NIOSH approved air-purifying respirator.

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. Use impervious gloves when prolonged or frequently repeated contact with the concentrate could occur.

EYE PROTECTION: Use chemical goggles when handling the concentrate. Eye wash fountain should be located in immediate work area.

## 9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: See label. Avoid breathing spray mist. Do not swallow. Avoid skin contact. Prevent eye contact. Wash thoroughly after handling. Keep away from children. Do not contaminate domestic water supplies or water used for irrigation.

(Continued on Page 6)

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M A T E R I A L   S A F E T Y   D A T A   S H E E T

Dow Chemical U.S.A.\*   Midland, MI 48674   Emergency Phone: 517-636-4400

Product Code: 38321

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Product Name: GARLON (R) 3A HERBICIDE

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MSDS:000639

9.   A D D I T I O N A L   I N F O R M A T I O N :   ( C O N T I N U E D )

MSDS STATUS:   Revised section 9 and regsheet.

(Continued on Page 7)

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M A T E R I A L   S A F E T Y   D A T A   S H E E T

Dow Chemical U.S.A.\*    Midland, MI 48674    Emergency Phone: 517-636-4400

Product Code: 38321    Page: 7

Product Name: GARLON (R) 3A HERBICIDE

Effective Date: 06/08/90    Date Printed: 06/13/90    MSDS:000639

**REGULATION INFORMATION: (Not meant to be all-inclusive--selected regulations represented.)**

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

**U.S. REGULATIONS**

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

- An immediate health hazard
- A delayed health hazard
- A fire hazard

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The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult The Dow Chemical Company For Further Information.

\* An Operating Unit of The Dow Chemical Company

# Material Safety Data Sheet



## GARLON\* 3A Herbicide

Emergency Phone: 517-636-4400  
General Phone: 1-800-352-8776

EPA Reg. Number: 62719-37  
Effective Date: August 31, 1994  
Product Code: 38321  
MSDS Number: 004422  
DowElanco • Indianapolis, IN 46268

### 1. INGREDIENTS:

(% w/w, unless otherwise noted)

Triclopyr (3,5,6-trichloro-2-pyridinyloxyacetic acid), as the triethylamine salt . . . CAS# 057213-69-1 .....44.4%  
Other ingredients, total, including: .....55.6%  
Water . . . CAS# 007732-18-5  
Proprietary emulsifiers and surfactants  
Ethanol (1%) . . . CAS# 000064-17-5  
Triethylamine (approx. 1%) . . . CAS# 000121-44-8

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

### 2. PHYSICAL DATA:

**BOILING POINT:** Not determined.  
**VAPOR PRESSURE:** Not determined.  
**VAPOR DENSITY:** Not applicable  
**SOLUBILITY IN WATER:** High  
**SPECIFIC GRAVITY:** 1.135 (68/68°F)  
**APPEARANCE:** Light purple/pink liquid  
**ODOR:** Ammonia-like odor

### 3. FIRE AND EXPLOSION HAZARD DATA:

**FLASH POINT:** 110°F, 43°C  
**METHOD USED:** TCC  
**FLAMMABLE LIMITS:**  
LFL: Not determined  
UFL: Not determined  
**EXTINGUISHING MEDIA:** Alcohol foam and CO<sub>2</sub>.  
**FIRE & EXPLOSION HAZARDS:** Toxic, irritating vapors may be formed or given off if product is involved in fire. Although product is water-based, it has a flash point due to the presence of small amounts of ethanol and triethylamine.  
**FIRE-FIGHTING EQUIPMENT:** Use positive-pressure, self-contained breathing apparatus and full protective clothing.

### 4. REACTIVITY DATA:

**STABILITY: (CONDITIONS TO AVOID)** Avoid sources of ignition if temperature is near or above flash point.

**INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)** Any oxidizing agent. Consult manufacturer for specific cases.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Nitrogen oxides and hydrogen chloride may be formed under fire conditions.

**HAZARDOUS POLYMERIZATION:** Will not occur.

### 5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

**ENVIRONMENTAL DATA:** Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

**ACTION TO TAKE FOR SPILLS/LEAKS:** Dike large spills. Keep out of streams and domestic water supplies. Absorb small spills in inert material such as dry sand.

**DISPOSAL METHOD:** Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your state pesticide or environmental control agency, or the hazardous waste representative at the nearest EPA regional office for guidance.

### 6. HEALTH HAZARD DATA:

**EYE:** May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. When tested on animals, dilutions of this product were less irritating to eyes than the undiluted product. Vapors of triethylamine may cause swelling of the cornea resulting in visual disturbances such as blurred, smoky, or halo vision.

**SKIN CONTACT:** Prolonged or repeated exposure may cause skin irritation, even a burn. When tested on animals, dilutions of this product were less irritating to skin than the undiluted product. Prolonged or frequently repeated skin contact may cause allergic skin reactions in some individuals. With end-use dilutions to 30% or more however, no allergic skin reaction has been observed.

**SKIN ABSORPTION:** A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The LD<sub>50</sub> for skin absorption in rabbits is greater than 2000 mg/kg.

# Material Safety Data Sheet



Emergency Phone: 517-836-4400  
General Phone: 1-800-352-6776

EPA Reg. Number: 62719-37  
Effective Date: August 31, 1994  
Product Code: 38321  
MSDS Number: 004422  
DowElanco • Indianapolis, IN 46268

## GARLON\* 3A Herbicide

**INGESTION:** Single dose oral toxicity is low. The oral LD50 was 2574 mg/kg for male rats and 1847 mg/kg for female rats. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; swallowing amounts larger than that may cause injury. Ingestion may cause gastrointestinal irritation or ulceration.

**INHALATION:** Based on animal data, short, single exposures to this formulation should pose no acute inhalation hazard.

**SYSTEMIC (OTHER TARGET ORGAN) EFFECTS:** Excessive exposure may cause liver or kidney effects. Ethanol, a minor component, has caused central nervous system and liver effects.

**CANCER INFORMATION:** The active ingredient did not cause cancer in long-term animal studies. This product contains a small amount of ethanol; epidemiology studies provide evidence that drinking of alcoholic beverages (containing ethanol) is associated with cancer, and and IARC has classified alcoholic beverages as carcinogenic to humans.

**TERATOLOGY (BIRTH DEFECTS):** For the active ingredient, birth defects are unlikely; even exposures having an adverse effect on the mother should have no effect on the fetus. Ethanol has caused birth defects in laboratory animals. Ethanol has also been toxic to the fetus in laboratory animal tests. Ethanol has been shown to cause human fetotoxicity and/or birth defects when ingested during pregnancy.

**REPRODUCTIVE EFFECTS:** In animal studies, triclopyr has been shown not to interfere with reproduction. Ethanol, a minor component, has produced some adverse effects on male fertility in laboratory animals and humans.

**MUTAGENICITY (EFFECTS ON GENETIC MATERIAL):** Results of in vitro ('test tube') mutagenicity tests have been negative for both triclopyr and ethanol. Results of mutagenicity tests in animals have been negative for triclopyr. Ethanol has been shown to be negative in some animal mutagenicity tests and positive in others. Ethanol is not believed to be a direct acting mutagen.

### 7. FIRST AID:

**EYES:** Hold eyelids open and flush with a steady gentle stream of water for 15 minutes. Get medical attention.

**SKIN:** Wash skin with soap and water. Get medical attention if irritation persists.

**INGESTION:** Call a physician or poison control center. Drink promptly a large quantity of milk, egg whites, or gelatin solution, or if these are not available, drink large quantities of water. Do not induce vomiting. Avoid alcohol.

**INHALATION:** Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. Get medical attention.

**NOTE TO PHYSICIAN:** Ingestion may cause tissue destruction, leading to stricture. If lavage is performed, endotracheal and/or esophagoscopy control is suggested. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

### 8. HANDLING PRECAUTIONS:

**EXPOSURE GUIDELINE(S):** Ethanol (ethyl alcohol): ACGIH TLV and OSHA PEL are 1000 ppm.

3,5,6-Trichloro-2-pyridyloxyacetic acid (Triclopyr), triethylamine salt: Dow Industrial Hygiene Guide (for air concentrations) is 2 mg/m<sup>3</sup> as the acid equivalent. Skin (skin contact is expected to be the primary route of exposure).

Triethylamine: ACGIH TLV is 1 ppm TWA, 5 ppm STEL, Skin (skin contact can be a significant route of exposure); OSHA PEL is 10 ppm TWA, 15 ppm STEL. PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

**VENTILATION:** Control airborne concentrations below the exposure guidelines. Provide general and/or local exhaust ventilation if necessary. General ventilation or outdoor air movement should be sufficient for normal handling operations such as mixing of spray solutions.

**RESPIRATORY PROTECTION:** Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for handling the concentrate under certain operations, use an approved air-purifying respirator.

**SKIN PROTECTION:** For handling prior to end-use of this product, when prolonged or frequently-repeated contact could occur, use protective clothing impervious to this material. Selection of specific items such as faceshield, gloves, boots, apron, or full-body suit will depend on operation.

For handling relative to end-use of this product, the Worker Protection Standard of 1993 requires that applicators and other handlers must wear long-sleeved shirt and long pants; waterproof gloves; and shoes and socks.

Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

# Material Safety Data Sheet



## GARLON\* 3A Herbicide

Emergency Phone: 517-636-4400  
General Phone: 1-800-352-6776

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Effective Date: August 31, 1994  
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Discard clothing and other absorbent materials that have been drenched or heavily contaminated with product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If there are no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

**EYE PROTECTION:** Wear goggles or face shield when handling; selection is based upon the potential for eye contact. Use chemical goggles when handling the concentrate. Applicators and other end-use handlers must wear protective eyewear.

### 9. ADDITIONAL INFORMATION:

**SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Keep out of reach of children. Causes irreversible eye damage. Harmful if swallowed, inhaled, or absorbed through skin. Prolonged or frequently-repeated skin contact may cause allergic skin reactions in some individuals. Do not get in eyes, on skin, or on clothing. Avoid breathing vapor or spray mist.

Store above 28 degrees F or agitate before use.

Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

For handling relative to end-use of this product, read the product label for further information concerning the use of personal protective equipment (PPE) under the Worker Protection Standard of 1993.

**MSDS STATUS:** Revised section 8.

### REGULATORY INFORMATION:

(Not meant to be all-inclusive—selected regulations represented).

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**SARA HAZARD CATEGORY:** This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

- An immediate health hazard
- A delayed health hazard
- A fire hazard

**STATE RIGHT-TO-KNOW:** The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in Section 1 of the MSDS.

Chemical name	CAS Number	List
Ethanol	000064-17-5	NJ1, PA1, NJ3
N,N-Diethylethanamine	000121-44-8	NJ1, NJ3, PA1, PA3,

NJ1=New Jersey Special Health Hazard Substance (present at greater than or equal to 0.1%).  
NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%).  
PA1=Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%).  
PA3=Pennsylvania Environmental Hazardous Substance (present at greater than or equal to 1.0%).

**TOXIC SUBSTANCES CONTROL ACT (TSCA):**  
All ingredients are on the TSCA inventory or are not required to be listed on the TSCA inventory.

**OSHA HAZARD COMMUNICATION STANDARD:**  
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATINGS:**

Category	Rating
Health	3
Flammability	2
Reactivity	0

The Information Herein is Given in Good Faith,  
But No Warranty, Express Or Implied, is Made.  
Consult DowElanco For Further Information.

# MATERIAL SAFETY DATA SHEET

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## 1. INGREDIENTS (% w/w, unless otherwise noted):

Triclopyr ((3,5,6-trichloro-2-pyridinyl)oxy) acetic acid, butoxy ethyl ester	CAS# 064700-56-7	61.6%
Other ingredients:		38.4%
Kerosene	CAS# 008008-20-6	
Proprietary ingredients		

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

## 2. PHYSICAL DATA:

BOILING POINT: >302F, 150C initial  
VAP. PRESS: 0.1mm @ 37.8C (kerosene)  
VAP. DENSITY: >1  
SOL. IN WATER: Emulsifies

SP. GRAVITY: 1.08  
APPEARANCE: Amber liquid.  
ODOR: Not available

## 3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 147F, 64C  
METHOD USED: TCC  
FLAMMABLE LIMITS  
LFL: Not determined  
UFL: Not determined

EXTINGUISHING MEDIA: Water fog, foam, CO2, and dry chemical  
FIRE AND EXPLOSION HAZARDS: Combustible.  
FIRE-FIGHTING EQUIPMENT: Use positive pressure self-contained breathing equipment.

## 4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Combustible. Avoid sources of ignition if temperature is near or above flash point.  
INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Acid, base, and oxidizing material.

HAZARDOUS DECOMPOSITION PRODUCTS: Nitrogen oxides, hydrogen chloride, and phosgene may result under fire conditions.  
HAZARDOUS POLYMERIZATION: Will not occur.

## 5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Dike large spills. Keep out of streams and domestic water supplies. Absorb small spills in inert material such as sand.  
DISPOSAL METHOD: In case of large spills, contact DowElanco.

Bury clean-up material from small spills in an approved landfill away from water supplies, in accordance with local, state, and federal regulations.

## 6. HEALTH HAZARD DATA:

EYE: May cause slight transient (temporary) eye irritation.  
SKIN CONTACT: Prolonged or repeated exposure may cause skin irritation. Prolonged or frequently-repeated skin contact may cause allergic reactions in some individuals. With the dilute mix, no allergic skin reaction is expected.  
SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The LD50 for skin absorption in rabbits is >2000 mg/kg. Repeated skin exposure may result in absorption of harmful amounts.  
INGESTION: Single dose oral toxicity is low. The oral LD50 for male rats is 1581 mg/kg and for females 1338 mg/kg. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; swallowing amounts larger than that may cause injury. If aspirated (liquid enters the lung), may cause lung damage or even death due to chemical pneumonia, a condition caused by petroleum and petroleum-like solvents.

INHALATION: Excessive exposure may cause irritation to upper respiratory tract. Signs and symptoms of excessive exposure may be central nervous system effects (due to kerosene).  
SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Repeated excessive exposures may cause liver, kidney or blood effects.  
CANCER INFORMATION: Did not cause cancer in long-term animal studies.  
TERATOLOGY (BIRTH DEFECTS): Birth defects are unlikely. Exposures having no effect on the mother should have no effect on the fetus. Did not cause birth defects in animals; other effects were seen in the fetus only at doses which caused toxic effects to the mother.  
REPRODUCTIVE EFFECTS: The active ingredient in this formulation has been shown in animals not to interfere with reproduction.  
MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): Results of in-vitro ("test-tube") mutagenicity tests have been negative. Results of mutagenicity tests in animals have been negative.

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DowElanco  
INDIANAPOLIS, IN 46268  
EMERGENCY PHONE:  
517-636-4400

# MATERIAL SAFETY DATA SHEET

PRODUCT CODE 38322  
**Garlon® 4**  
HERBICIDE  
EFFECTIVE DATE 07/25/90  
DATE PRINTED: 02/05/91 MSDS: 001314

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## 7. FIRST AID:

**EYES:** Irrigate with flowing water immediately and continuously for at least 5 minutes.

**SKIN:** Wash off in flowing water or shower.

**INGESTION:** Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

**INHALATION:** Remove to fresh air if effects occur. Consult a physician.

**NOTE TO PHYSICIAN:** The decision of whether to induce vomiting or not should be made by an attending physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient. Repeated excessive exposure may aggravate preexisting liver and kidney disease.

## 8. HANDLING PRECAUTIONS:

**EXPOSURE GUIDELINE(S):** For 3,5,6-trichloro-2-pyridinyloxyacetic acid, butoxyethyl ester (triclopyr, butoxyethyl ester), the Dow Industrial Hygiene Guide is 2 mg/m<sup>3</sup> as the acid equivalent, Skin. Dow Industrial Hygiene Guide is 10 mg/m<sup>3</sup> for kerosene.

**VENTILATION:** Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

**RESPIRATORY PROTECTION:** Atmospheric levels should be

maintained below the exposure guidelines. When respiratory protection is required for handling the concentrate under certain operations, use an approved air-purifying respirator.

**SKIN PROTECTION:** For brief contact, no precautions other than clean body-covering clothing should be needed. Use impervious gloves when prolonged or frequently repeated contact with the concentrate could occur.

**EYE PROTECTION:** Use safety glasses.

## 9. ADDITIONAL INFORMATION:

**SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Keep out of reach of children. Do not use near heat or open flame. Avoid contact with eyes, skin or clothing. Do not ship or store with food, feeds, drugs, or clothing. Do not contaminate water, food, or feed by storage or disposal.

**MSDS STATUS:** Revised sections 6 and 8. Also revised Regulatory section.

**REGULATORY INFORMATION:** (Not meant to be all-inclusive – selected regulations represented.)

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responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

### U.S. REGULATIONS:

**SARA HAZARD CATEGORY:** This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:  
An immediate health hazard  
A delayed health hazard  
A fire hazard

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## MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 87096

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PRODUCT NAME: TORDON (R) K HERBICIDE

Effective Date: 06/18/85 Date Printed: 08/02/86

MSDS:000380

### 1. INGREDIENTS:

4-Amino-3,5,6-trichloropicolinic acid, (picloram)	
Potassium salt	CAS# 002545-60-0 24.4%
Inerts	75.6%
Water	CAS# 007732-18-5
Plus proprietary dispersing agents	

Substances listed in the Ingredients Section are those identified as being present at a concentration of 1% or greater, or 0.1% if the substance is on the list of potential carcinogens cited in OSHA Hazard Communication Standard. Where proprietary ingredient shows, the identity of this substance may be made available as provided in 29 CFR 1910.1200(i).

### 2. PHYSICAL DATA:

BOILING POINT: IBP 212F, 100C  
VAP PRESS: Approx. 23 mmHg @ 20C  
VAP DENSITY: Not applic.  
SOL. IN WATER: Infinite  
SP. GRAVITY: 1.160 (68/68F, 20C)  
APPEARANCE: Brown-liquid.  
ODOR: Not available.

### 3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: \*See below  
METHOD USED: \*TCC

FLAMMABLE LIMITS  
LFL: Not deter.  
UFL: Not deter.

(Continued on Page 2)

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**MATERIAL SAFETY DATA SHEET**

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Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 87096

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PRODUCT NAME: TORDON (R) K HERBICIDE

Effective Date: 06/18/85 Date Printed: 08/02/86

MSDS:000380

**3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)**

EXTINGUISHING MEDIA: Alcohol foam, CO2, dry chemical.

FIRE & EXPLOSION HAZARDS: Keep away from possible ignition sources. No autoignition temperature when tested to 1022F, 550C.

\*none observed up to 214F (TCC)

FIRE-FIGHTING EQUIPMENT: Positive-pressure, self-contained air supply. Avoid getting water from fire fighting into domestic or irrigation water supplies.

**4. REACTIVITY DATA:**

STABILITY: (CONDITIONS TO AVOID) Combustible; avoid sources of ignition if temperature is near or above flash point.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) None under normal use conditions. Under abnormal conditions avoid oxidizing materials and strong acids. Consult manufacturer for specific cases.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen chloride and nitrogen oxides under fire conditions.

HAZARDOUS POLYMERIZATION: Will not occur.

**5. ENVIRONMENTAL AND DISPOSAL INFORMATION:**

ACTION TO TAKE FOR SPILLS/LEAKS: Absorb in inert material such as sand or sawdust. In case of large spills, dike area to contain. Consult manufacturer for clean-up.

DISPOSAL METHOD: Bury in non-crop land away from water supplies or dispose of in a landfill approved for pesticides in accordance with applicable federal, state and local regulations.

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**MATERIAL SAFETY DATA SHEET**

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 87096

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PRODUCT NAME: TORDON (R) K HERBICIDE

Effective Date: 06/18/85 Date Printed: 08/02/86

MSDS:000380

**6. HEALTH HAZARD DATA:**

**EYE:** May cause slight transient (temporary) irritation with corneal injury. In animals, irritation and corneal injury healed within 48 hours.

**SKIN CONTACT:** Prolonged or repeated exposure may cause skin irritation, even a burn.

**SKIN ABSORPTION:** A single prolonged skin exposure is not likely to result in absorption of harmful amounts. The LD50 for skin absorption in rabbits is >2000 mg/kg.

**INGESTION:** Single dose oral toxicity is low. The LD50 for rats is 10,330 mg/kg.

**INHALATION:** Single exposure to vapors is not likely to be hazardous.

**SYSTEMIC & OTHER EFFECTS:** Repeated excessive exposures to high amounts may cause liver effects. Did not cause cancer in long-term animal studies. Birth defects are unlikely. Even exposures having an adverse effect on the mother should have no effect on the fetus. The preponderance of data show picloram to be non-mutagenic in "in vitro" (test tube) tests and in test animals and is therefore believed to pose no mutagenic risk.

**7. FIRST AID:**

**EYES:** Irrigate with flowing water immediately and continuously for fifteen minutes. Consult medical personnel.

**SKIN:** Wash off in flowing water or shower. Remove contaminated clothing and wash before reuse.

**INGESTION:** Induce vomiting if large amounts are ingested. Consult medical personnel.

**INHALATION:** Remove to fresh air if effects occur. Consult medical.

(Continued on Page 4)

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**MATERIAL SAFETY DATA SHEET**

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 87096

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**PRODUCT NAME: TORDON (R) K HERBICIDE**

Effective Date: 06/18/85 Date Printed: 08/02/86

MSDS:000380

**7. FIRST AID: (CONTINUED)**

**NOTE TO PHYSICIAN:** If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

**8. HANDLING PRECAUTIONS:**

**EXPOSURE GUIDELINE (S):** ACGIH TLV for picloram is 10 mg/m<sup>3</sup>.

**VENTILATION:** Control airborne concentrations below the exposure guideline. Good general ventilation should be sufficient for most conditions.

**RESPIRATORY PROTECTION:** Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use a NIOSH approved air-purifying respirator with an organic vapor or pesticide cartridge.

**SKIN PROTECTION:** Use gloves which are permeation resistant when prolonged or frequently repeated contact could occur. Examples of effective protective clothing materials are neoprene and nitrile butadiene rubber.

**EYE PROTECTION:** Use safety glasses.

**9. ADDITIONAL INFORMATION:**

**SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:** Keep out of reach of children. Keep away from heat and open flame. Avoid contact with skin and eyes. Provide eye fountain and washing facilities near work area. Do not ship or store with food, feeds, drugs or clothing. Do not contaminate irrigation or domestic water, food or feed by storage or disposal.

**MSDS STATUS:** Revised 1, 2, 3, 5, 6, 7, 8, and 9.

(Continued on Page 5)

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M A T E R I A L   S A F E T Y   D A T A   S H E E T

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Dow Chemical U.S.A. Midland, MI 48674   Emergency Phone: 517-636-4400

Product Code: 87096

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PRODUCT NAME: TORDON (R) K HERBICIDE

Effective Date: 06/18/85   Date Printed: 08/02/86

MSDS:000380

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For Further Information.

**Special Fire Fighting Procedures:** Firefighters and others that may be exposed to vapors, mists, or products of combustion should wear full protective clothing and self-contained breathing apparatus. Equipment should be thoroughly cleaned after use.

**Unusual Fire or Explosion Hazards:** None

#### 6. ACCIDENTAL RELEASE MEASURES

Observe all protection and safety precautions when cleaning up spills—See Exposure Controls/Personal Protection, Section 8.

Collect spilled material and/or contaminated soil and place in metal drum or plastic-lined fiber drum and dispose of in accordance with the instructions provided under DISPOSAL. Thoroughly scrub floors, truck beds or other impervious surfaces with industrial detergent solution and rinse with water.

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

#### 7. HANDLING AND STORAGE \*\*\*

##### Handling:

- Avoid contact with skin, eyes or clothing.
- Avoid breathing dust.
- User should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark.
- Do not contaminate water when disposing of equipment washwaters.

**Storage:** Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

#### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION \*\*\*

##### Personal Protective Equipment:

**Eye Protection:** ROUNDUP® DRY PAK Water Soluble Granule herbicide does not cause significant eye irritation or eye toxicity requiring special protection. Use good industrial practice to avoid eye contact.

**Skin Protection:** Wear appropriate protective clothing to prevent skin contact. Applicators and other handlers must wear long-sleeved shirt, long pants, shoes plus socks. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

**Respiratory Protection:** ROUNDUP® DRY PAK Water Soluble Granule herbicide is not likely to present an airborne exposure concern under normal use. In work situations where an air purifying respirator is appropriate to be used, use a half face or full face respirator equipped with purifying elements for protection against dust/mist. Use filtering elements with MSHA/NIOSH approval prefix TC-21C. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed.

**Ventilation:** No special precautions are recommended.

**Exposure Guidelines:**

Exposure Limits	OSHA PEL	ACGIH TLV
ROUNDUP® DRY PAK	None established	None established

OSHA and ACGIH have not established specific exposure limits for this material. However, OSHA and ACGIH have established limits for nuisance dusts which are the least stringent exposure limits applicable to dusts. The OSHA PEL/TWA for nuisance dusts is 15 mg/m<sup>3</sup> total dust, and 5 mg/m<sup>3</sup> respirable dust. The ACGIH TLV/TWA for nuisance dusts is 10 mg/m<sup>3</sup> total dust. Use control measures as specified above to minimize exposures.

#### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** White crystalline granular material

**Odor:** None

**Bulk Density:** 59.5 grams per 100 ml

**Solubility:** Very soluble in water, insoluble in organic solvents

**pH:** 1% in water = 3.85

5% in water = 3.88

10% in water = 3.77

**Note:** These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot of as specification items.

#### 10. STABILITY AND REACTIVITY

**Chemical Stability:** Stable under normal conditions of warehouse storage.

#### Conditions to Avoid: None

**Incompatibility with Other Materials:** Spray solutions of this product should be mixed, stored or applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

Do not mix, store or apply this product or spray solutions of this product in galvanized or unlined steel (except stainless steel) containers or spray tanks. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

#### Hazardous Decomposition Products: None

**Hazardous Polymerization:** Does not occur. This product can react with caustic (basic) materials to liberate heat. This is not a polymerization but rather a chemical neutralization in an acid base reaction.

#### 11. TOXICOLOGICAL INFORMATION

##### TOXICOLOGICAL DATA

Data from laboratory studies conducted by Monsanto with MON 8750 which has the same composition as ROUNDUP® DRY PAK Water Soluble Granule herbicide are summarized below:

Single exposure (acute) studies indicate:

Oral LD<sub>50</sub> (rat): 4,813 mg/kg, slightly toxic, Category III

Dermal LD<sub>50</sub> (rabbit): >5,000 mg/kg, practically non-toxic, Category IV

Eye Irritation (Rabbit, 24-hr): Slightly irritating—all animals were free of ocular irritation within 3 days, Category IV

Skin Irritation (Rabbit, 4-hr): Nonirritating, Category IV

Inhalation LC<sub>50</sub> (rat, 4-hr): >1.9 mg/L, the highest atmospheric concentration achievable in this study, Category III

No skin allergy was observed in guinea pigs following repeated exposure.

##### COMPONENTS

Data from laboratory studies conducted by Monsanto and from the scientific literature on components of ROUNDUP® DRY PAK Water Soluble Granule herbicide:

##### Glyphosate

Additional toxicity information is available on glyphosate, the active herbicidal ingredient of ROUNDUP® DRY PAK Water Soluble Granule herbicide. Following repeated exposures (90-days) to glyphosate in their feed, decreased weight gains were noted at the highest test level in mice, while no treatment-related effects occurred in rats. Following repeated skin exposure (3 weeks) to glyphosate, slight skin irritation was the primary effect observed in rabbits. No skin allergy was observed in guinea pigs following repeated skin exposure. There was no evidence of effects on the nervous system, including delayed effects in chickens (repeat oral doses) or cholinesterase inhibition in rats (single oral doses). Reduced body weight gain and effects on liver tissues were observed with long-term (2-year) feeding of glyphosate to mice at high-dose levels. Reduced body weight gain and eye changes were observed at the high-dose level in one long-term (2-year) feeding study with rats, while no treatment-related effects occurred in a second study. No adverse effects were observed in feeding studies with dogs. Glyphosate did not produce tumors in any of these studies. Based on the results from the chronic studies, EPA has classified glyphosate in category II (evidence of non-carcinogenicity for humans). No birth defects were noted in rats and rabbits given glyphosate orally during pregnancy, even at amounts which produced adverse effects on the mothers. Glyphosate was fed continuously to rats at very high dose levels for 2 successive generations. Toxicity was reported in offspring from the high dose, a level which also produced adverse effects on the mothers. In a 3 generation study conducted at lower dose levels, no effects were seen on the ability of male or female rats to reproduce. Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells.

#### 12. ECOLOGICAL INFORMATION \*\*\*

**Aquatic and Avian studies with ROUNDUP® DRY PAK Water Soluble Granule herbicide** have not been conducted at this time. However, an extensive database of studies exists for the active ingredient glyphosate. These studies indicate that glyphosate ranges from practically non-toxic to slightly toxic in a variety of aquatic and avian species. For a glyphosate MSDS or additional information, contact Monsanto at 1-800-332-3111.

#### 13. DISPOSAL CONSIDERATIONS

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a facility approved for pesticide disposal or in accordance with applicable Federal, State or local procedures. Empty container retains vapor and product residue. Observe all labeled safeguards until container is destroyed. Do not reuse container.

Completely empty packet into application equipment. Dispose of the packet in a sanitary landfill or by incineration, as allowed by State and local authorities, by burning. If burned, stay out of smoke. Dispose of box in same manner.

#### 14. TRANSPORT INFORMATION \*\*\*

Follow the instructions indicated in the Handling and Storage sections of Section 7 of this MSDS.

DOT Proper Shipping Name: Not Applicable

DOT Hazard Class/I.D. No.: Not Applicable

DOT Label: Not Applicable

U.S. Surface Freight Classification: Weed Killing Compound, N.E.R.N.

#### 15. REGULATORY INFORMATION

##### SARA Hazard Notification:

**Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):** Immediate

**Section 313 Level Chemical(s):** Not Applicable

**Reportable Quantity (RQ) Under U.S. CERCLA:** Not Applicable

**TSCA Inventory:** All components are on the U.S. EPA's TSCA Inventory List

#### 16. OTHER

**Reason for Revision:** New CMA Format; Add WPS language; Add ecological effects; Potential Adverse Health effect (asthma) (huff information)

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Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling. And all necessary and appropriate precautionary use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA approved label.

Although the information and recommendations set forth herein (as presented "information") are presented in good faith and believed to be correct as of the date hereof, Monsanto Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Monsanto Company be responsible for damages of any nature whatsoever resulting from the use of or reliance on any information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS. ROUNDUP® is a registered trademark of Monsanto Company.

## ROUNDUP® PRO HERBICIDE

#### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** ROUNDUP® PRO Herbicide

**Synonyms:** MON 65005

**EPA Reg. No.:** 324-475

##### MANUFACTURER

**MONSANTO COMPANY**

800 NORTH LINDBERGH

ST. LOUIS, MO 63167, U.S.A.

**EMERGENCY PHONE NO. (CALL COLLECT):** (314) 694-4000

**NON-EMERGENCY INFORMATION:** 1-800-332-3111

**Revisions:** Sections containing a revision or new information are marked with a \*\*\*

RECORDERS MEMORANDUM  
All or parts of the text on this page was not clearly legible for satisfactory recordation.

MSDS Number: S00012732  
 Date: November, 1995  
 Supersedes: August, 1995

## 2. COMPOSITION INFORMATION ON INGREDIENTS

### Chemical Ingredients:

Active Ingredient:	Glyphosate, N-(phosphonomethyl) glycine, in the form of its isopropylamine salt	41.0%
Inert Ingredients:	(Including surfactant)	59.0%
		100.0%

Component	CAS Reg No	wt %
Glyphosate, isopropylamine salt	38461-94-0	41.0%
Phosphate ester neutralized polyoxyethylene sulfonate	—	14.5%

No Hazardous Chemicals Under OSHA Hazard Communication Standard (29 CFR §1910.1200).  
 No components subject to the reporting requirements of SARA §313.

See Section 8 for exposure limits.

## 3. HAZARDS IDENTIFICATION\*\*\*

### Emergency Overview:

Appearance & Odor: Clear, viscous amber-colored solution.

Warning Statements: Keep out of reach of children.

### CAUTION!

CAUSES EYE IRRITATION.

REFORMULATION IS PROHIBITED.

SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

### Potential Adverse Health Effects:

Usual Routes of Exposure: Skin contact and inhalation.

Eye Contact: ROUNDUP® PRO herbicide may cause pain, redness, and tearing based on toxicity studies.  
 Skin Contact: ROUNDUP® PRO herbicide is no more than slightly toxic and no more than slightly irritating based on toxicity studies.

Ingestion: ROUNDUP® PRO herbicide is no more than slightly toxic based on toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed. Ingestion of similar formulations has been reported to produce gastrointestinal discomfort with irritation of the mouth, nausea, vomiting, and diarrhea. Oral ingestion of large quantities of one similar product has been reported to result in hypotension and lung edema.

Inhalation: ROUNDUP® PRO herbicide is no more than slightly toxic if inhaled based on toxicity studies.

## 4. FIRST AID MEASURES\*\*\*

If in Eyes: Flush with plenty of water. Get medical attention if irritation persists.

NOTE: For additional human emergency first aid or treatment guidance, call collect, anytime, day or night (314) 954-4000.

## 5. FIRE FIGHTING MEASURES

Flash Point: >200°F

Method: Pensky-Martens

Auto Ignition Temperature: Not determined.

Extinguishing Media: Water spray, foam, dry chemical, CO<sub>2</sub>, or any class B extinguishing agent.

Special Fire Fighting Procedures: Firefighters and others that may be exposed to vapors, mists, or products of combustion should wear full protective clothing and self-contained breathing apparatus. Equipment should be thoroughly cleaned after use.

Unusual Fire or Explosion Hazards: None.

## 6. ACCIDENTAL RELEASE MEASURES

Observe all protection and safety precautions when cleaning up spills—See Exposure Controls/Personal Protection, Section 8.

Small Spills: For a spill less than one gallon on floor or other impervious surface, soak up with towels or other absorbent material and discard in the trash. Clean the spill area with soap and water and rinse the area thoroughly.

Large Liquid Spills: On the floor or other impervious surface should be contained or diked and then absorbed

with attapulgite, bentonite, or other absorbent clays. Collect the contaminated absorbent, place in a metal drum, and dispose of in accordance with the instructions provided under DISPOSAL, Section 13 of this MSDS. Thoroughly scrub floor or other impervious surface with a strong industrial detergent and rinse with water.

Large spills that soak into the ground should be dug up, placed in metal drums, and disposed of in accordance with instructions provided under DISPOSAL, Section 13 of this MSDS. Contact appropriate state agency when considering a land spreading disposal option.

Leaking containers should be separated from nonleakers and either the container or its contents transferred to a drum or other nonleaking container and disposed of in accordance with instructions provided under DISPOSAL, Section 13 of this MSDS. Any recovered spilled liquid should be similarly collected and disposed of.

## 7. HANDLING AND STORAGE\*\*\*

### Handling:

- Avoid contact with eyes or clothing.
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark.
- Do not contaminate water when disposing of equipment washwaters.

### Storage:

- Do not contaminate water, foodstuffs, feed, or seed by storage or disposal.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Personal Protective Equipment:

Eye Protection: Workers handling the packaged concentrate should wear chemical safety goggles to prevent eye contact during mixing/transfer operations or other activities where there is potential for eye contact with the concentrated product. The wearing of goggles is not required during use of this product in accordance with label instruction.

Skin Protection: Wear appropriate protective clothing to prevent skin contact. Applicators and other handlers must wear long-sleeved shirt, long pants, shoes plus socks. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Respiratory Protection: For Handling the Concentrated Product: Avoid breathing vapor or mist. This product's concentrate is not likely to pose an airborne exposure concern during manufacture or packaging. In the event of abnormal exposure conditions, use NIOSH/MSHA-approved equipment. In work situations where an air purifying respirator is appropriate to be used, use of a full face respirator equipped with purifying elements for protection against organic vapor and dust/mist approved for pesticides is recommended. Use cartridges with NIOSH/MSHA approval number TC-23C or canister with NIOSH/MSHA approval number TC-14G. Full facepiece replaces the need for chemical goggles. Observe respirator use limitations specified by the manufacturers. Respiratory protection programs must comply with 29 CFR 1910.134.

For Use of Product in accordance with label instructions: Respirators are not required for use of ROUNDUP® PRO herbicide in accordance with label instructions.

Ventilation: No special precautions are recommended.

### Exposure Guidelines:

Exposure Limits	OSHA PEL	ACGIH TLV
ROUNDUP® PRO	None established	None established

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear, viscous amber-colored solution.

Odor: Practically odorless to slight amine-like odor.

pH: 4.99 (1% solution)

Specific Gravity: 1.17 (Water = 1)

Notes: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

## 10. STABILITY AND REACTIVITY

Chemical Stability: Stable for at least 5 years under normal conditions of warehouse storage.

Conditions to Avoid: None.

Incompatibility with Other Materials: Spray solutions of this product should be mixed, stored, or applied using only stainless steel, aluminum, fiberglass, plastic, or plastic-lined containers.

DO NOT MIX, STORE, OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED OR INHIBITED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette, or other ignition source.

Hazardous Decomposition Products: None.

Hazardous Polymerization: Does not occur. This product can react with caustic (basic) materials to liberate heat. This is not a polymerization but rather a chemical neutralization in an acid base reaction.

## 11. TOXICOLOGICAL INFORMATION\*\*\*

Data from laboratory studies conducted by Monsanto with ROUNDUP® PRO herbicide are summarized below: Single exposure (acute) studies indicate:

Oral—Rat LD<sub>50</sub>: 5,500 mg/kg; FIFRA Category IV.

Dermal—Rat LD<sub>50</sub>: 5,000 mg/kg; FIFRA Category IV.

Inhalation—Rat (4-hr. exp.): 4.2 mg/l; FIFRA Category IV; Not (DSE) poisonous.

Eye Irritation: Moderate to moderately irritating; all animals free of irritation by day 7, FIFRA Category III.

Skin Irritation: Rabbit (4-hr. exp.): slightly irritating; PI - 0.63/8.0, all animals free of irritation by day 7, FIFRA Category IV.

No skin allergy was observed in guinea pigs following repeated skin exposures.

### COMPONENTS

Data from laboratory studies conducted by Monsanto and from the toxicological literature on components of ROUNDUP® PRO herbicide.

### Isopropylamine Salt of Glyphosate

Data from studies with a formulation comprised of 62% isopropylamine salt of glyphosate (MON 0139) indicate the following:

In repeat dosing studies (6 month), dogs fed MON 0139 exhibited significant weight changes. Following repeated skin exposures (3 weeks) to MON 0139, skin irritation was the primary effect in rabbits.

Additional toxicological information is available on glyphosate, the active herbicide ingredient of MON 0139. Following repeated exposure (90-day) to glyphosate in their feed, decreased weight gains were noted at the highest test levels in rats, while no treatment-related effects occurred in rats. Following repeated skin exposure (3-week) to glyphosate, slight skin irritation was the primary effect observed in rabbits. No skin allergy was observed in guinea pigs following repeated skin exposures. There was no evidence of effects on the nervous system, including delayed effects in chickens (repeat oral doses) or cholinesterase inhibition in rats (single oral doses). Reduced body weight gain and effects on liver tissues were observed with long term (2-year) feeding of glyphosate to mice at high dose levels. Reduced body weight gain and eye changes were observed at the high-dose level in one long-term (2-year) feeding study with rats, while no treatment-related effects occurred in a second study. No adverse effects were observed in feeding studies with dogs. Glyphosate did not produce tumors in any of these studies. Based on the results from the chronic studies, EPA has classified glyphosate in category E (evidence of noncarcinogenicity to humans). No birth defects were noted in rats and rabbits given glyphosate orally during pregnancy, and all offspring which produced adverse effects on the mothers. Glyphosate was fed continuously to rats at very high dose levels for 2 successive generations. Toxicity was reported in offspring from the high dose, a level which also produced adverse effects on the mothers in a 2-generation study conducted at lower dose levels. No effects were seen on the ability of male or female rats to reproduce. Glyphosate has produced no genetic changes in a variety of standard tests using animals and animal or bacterial cells.

## 12. ECOLOGICAL INFORMATION

Aquatic and avian studies with this product have not been conducted at this time. However, an extensive database of studies exists for the active ingredient glyphosate. These studies indicate that glyphosate ranges from practically nontoxic to slightly toxic in a variety of aquatic and avian species. For glyphosate MSDS or additional information, contact Monsanto at 1-800-332-3111.

RECORDERS MEMORANDUM  
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**13. DISPOSAL CONSIDERATIONS**

Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, State, or local procedures.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

**14. TRANSPORT INFORMATION**

Follow the precautions indicated in the Handling and Storage Section, Section 7 of this MSDS.

DOT Proper Shipping Name: Not applicable.

DOT Hazard Class/I.D. No.: Not applicable.

DOT Label: Not applicable.

U.S. Surface Freight Classification: Weed killing compound, N.O.I.B.N.

**15. REGULATORY INFORMATION**

SARA Hazard Notification:

Hazard Categories under Criteria of SARA Title III Rules (40 CFR Part 370): Immediate.

Section 313 Toxic Chemical(s): Not applicable.

Hazardous Chemicals Under OSHA Hazard Communication Standard (29 CFR 1910.1200): None.

Reportable Quantity (RQ) under U.S. CERCLA: Not applicable.

TSCA Inventory: All components are on the US EPA's TSCA Inventory List.

**16. OTHER\*\***

Reasons for revision: Acute inhalation toxicity result reclassified by EPA to category IV.

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Use, storage, and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-approved label.

Although the information and recommendations set forth herein (hereinafter "information") are presented in good faith and believed to be correct as of the date hereof, Monsanto Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Monsanto Company be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

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ROUNDPRO.118

MAC-5058

**RECORDERS MEMORANDUM**

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Du Pont Agricultural Products

M0000019



Revised 11-Nov-90

Printed 19-Jun-91

## "HYVAR" X-L Herbicide

### MATERIAL IDENTIFICATION

Corporate Number	DU003802		
"HYVAR" is a registered trademark of Du Pont.			
Manufacturer/Distributor	Du Pont 1007 Market Street Wilmington, DE 19898		
Phone Numbers	Product Information	1-(800)441-7515	
	Transport Emergency	1-(800)424-9300	
	Medical Emergency	1-(800)441-3637	
Chemical Family	URACIL		
Du Pont Registry Number	DP17-54-3		
NFPA Ratings	Health:	1	
	Flammability:	2	
	Reactivity:	0	
NPCA-HMIS Ratings	Health:	1	
	Flammability:	2	
	Reactivity:	0	
Personal Protection rating to be supplied by user depending on use conditions.			

### COMPONENTS

Material	CAS Number	Percent
BROMACIL	314-40-9	21.9
(LITHIUM SALT OF 5-BROMO-3-SEC-BUTYL-6-METHYLURACIL)		
INERT INGREDIENTS		78.1
(INCLUDES PERCENTAGES OF THE FOLLOWING:)		
*ETHYLENE GLYCOL	107-21-1	30-35
ETHANOL	64-17-5	<10
*METHANOL	67-56-1	<5

\* Regulated as a Toxic Chemical under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

(continued)

## PHYSICAL DATA

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Water Solubility	Soluble
pH	11.2 - 12.2
Odor	Alcoholic
Form	Liquid
Color	Amber
Density	1.12 g/cc

## HAZARDOUS REACTIVITY

Instability	Stable at normal temperatures and storage conditions.
Incompatibility	Incompatible with acids and amines, especially primary amines.
Decomposition	Decomposes with heat.
Polymerization	Polymerization will not occur.

## FIRE AND EXPLOSION DATA

Flash Point	44°C (110°F)
Method	Setaflash
Autoignition	410°C (770°F)
Fire and Explosion Hazards	Combustible. Heating can release vapors which can be ignited.
Extinguishing Media	Water Spray. Foam. Dry Chemical. CO2.
Special Fire Fighting Instructions	Wear self-contained breathing apparatus. Use water spray. Cool tank/container with water spray.  If area is heavily exposed to fire and if conditions permit, let fire burn itself out since water may increase the area contaminated.

## HEALTH HAZARD INFORMATION

**WARNING!** Harmful or fatal if swallowed. Causes eye irritation. May irritate nose, throat and skin.

Oral LD50: 1,414 mg/kg (rats)  
Considered slightly toxic.

Dermal LD50: >2,000 mg/kg (rabbits)  
Moderately toxic.

SKIN IRRITATION AND SENSITIZATION

(continued)

**HEALTH HAZARD INFORMATION** (continued)

Mild to moderate irritation occurs following exposure to "Hyvar" X-L. It did not produce skin sensitization.

**EYE CONTACT**

"Hyvar" X-L Herbicide is an eye irritant causing mild corneal opacity.

**INHALATION**

LC50 is >5 mg/L for rats for a 1-hour exposure.

**CHRONIC STUDIES - (TECHNICAL BROMACIL)**

The compound is a moderate skin irritant, is a mild to moderate eye irritant, and is not a skin sensitizer. Rabbits acutely exposed via dermal route demonstrated no clinical signs of toxicity, and no gross tissue changes were observed at the highest practical dose, 5,000 mg/kg.

**INHALATION**

Acute exposure of rats resulted in only general signs of distress, rapid and deep respiration, at the highest dose tested, 4.8 mg/L. Toxicity described in animals repeatedly exposed to 0.1, 0.5 or 2.0 mg/L of the compound for two weeks include slightly increased platelet counts, and lower serum cholesterol in the group exposed to 2.0 mg/L. Slightly increased liver weights were noted in the groups exposed to 0.5 or 2.0 mg/L. All remaining animals were normal after a 14-day recovery period.

**INGESTION**

When a massive dose was administered to the dog (5,000 mg/kg), incoordination, salivation, vomiting, weakness, lacrimation and dilated pupils were observed. Toxicity described in animals repeatedly exposed to near lethal doses included liver changes, increased liver, adrenal and heart weights, and decreased brain, kidney and spleen weights. In another study, body weights were lower and changes were noted in the liver, kidneys and thyroids in rats repeatedly fed 2,500 ppm in the diet for 90 days. Dogs fed 50, 250 or 1,250 ppm of the compound for two years had no evidence of toxicity in any exposure group. Rats fed the same doses of the compound for two years had lower weight gain, and there were suggestions of slight thyroid effects, focal hyperplasia, in the high dose group. Mice that were administered 250, 1,250 or 5,000 ppm in the diet for 18 months demonstrated reduced growth rates at 1,250 ppm in females and at 5,000 ppm in males. Higher mortality was noted among female mice in the high dose group. Increased incidences of naturally occurring changes in aging mice, including testicular tubule atrophy and liver effects, were observed at the higher doses. An increase in total liver tumors that was above the normal background incidence was observed in high-dose male mice. This response in male mice is considered only as limited evidence of a carcinogenic response in the species. The weight of the scientific data

(continued)

HEALTH HAZARD INFORMATION (continued)

for Bromacil suggests that this is not indicative of a similar response in female mice, other laboratory animals or in man.

Additional animal testing indicated that this compound was not teratogenic and was not uniquely toxic to the conceptus. No reproductive effects were observed in rats exposed to 250 ppm in the diet for three generations. The compound does not produce heritable genetic damage in animals. Most studies for genetic damage in mammalian and bacterial cells in culture were also negative.

METHANOL

Toxic effects that may result from excessive exposure to methanol include visual disturbances or blindness, narcosis and other CNS effects, liver effects, and acidosis.

Individuals with preexisting diseases of the retina or liver may have increased susceptibility to methanol toxicity.

ETHYLENE GLYCOL

Excessive exposures in laboratory animal tests resulted in effects on the kidney and liver. Ingestion of excessive amounts by pregnant animals resulted in maternal and fetotoxicity. When animals were exposed to lower concentrations of ethylene glycol, these effects were not observed.

ETHANOL

Toxic effects described in animals include effects on the liver, reproductive system, and cardiovascular system along with CNS depression.

<b>Carcinogenicity</b>		None of the components in this material is listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.
<b># Applicable Exposure Limits</b>		
BROMACIL		
AEL * (Du Pont)		10 mg/m3, 8 & 12 Hr. TWA
TLV (ACGIH)		1 ppm, 11 mg/m3 - 8 Hr TWA
PEL (OSHA)		1 ppm, 10 mg/m3 - 8 Hr TWA
ETHYLENE GLYCOL		
AEL * (Du Pont)		50 ppm - 8 Hr. TWA, vapor
		10 mg/m3 - 8 Hr. TWA, particulate
TLV (ACGIH)		50 ppm, 127 mg/m3, vapor and mist ceiling
PEL (OSHA)		50 ppm, 125 mg/m3, vapor (ceiling)
ETHANOL		
AEL * (Du Pont)		1000 ppm (8 & 12 hr TWA)
TLV (ACGIH)		1,000 ppm, 1,880 mg/m3 - 8 Hr TWA
PEL (OSHA)		1,000 ppm, 1,900 mg/m3 - 8 Hr TWA

(continued)

**HEALTH HAZARD INFORMATION** (continued)**METHANOL**AEL \* (Du Pont)  
TLV (ACGIH)200 ppm - 8 & 12 Hr. TWA - Skin  
200 ppm, 262 mg/m<sup>3</sup> - 8 Hr TWA  
STEL 250 ppm, 328 mg/m<sup>3</sup> - Skin  
200 ppm, 260 mg/m<sup>3</sup> - 8 Hr TWA  
STEL 250 ppm, 325 mg/m<sup>3</sup> - Skin

PEL (OSHA)

\* AEL is Du Pont's Acceptable Exposure Limit.

**Safety Precautions**

Do not get in eyes. Avoid breathing vapors or mist. Avoid contact with skin. Avoid contact with clothing. Wash thoroughly after handling.

**FIRST AID****Inhalation**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Skin Contact**

In case of contact, immediately wash skin with soap and water. Wash contaminated clothing before reuse.

**Eye Contact**

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

**Ingestion**

If swallowed, immediately give 2 glasses of water and induce vomiting. Never give anything by mouth to an unconscious person. Call a physician.

**PROTECTION INFORMATION****Generally Applicable Control Measures and Precautions**

Use only with adequate ventilation. Keep away from heat, sparks and flames. Keep container tightly closed. Do not consume food, drink or tobacco in the areas where they may become contaminated with this material.

**Personal Protective Equipment**

While no PPE is specified when using this product according to label instructions, the following precautionary measures are recommended:

Wear safety glasses or chemical splash goggles.

Where there is potential for airborne exposures in excess of applicable limits, wear NIOSH/MSHA approved respiratory protection.

Where there is potential for skin contact have available and wear as appropriate, impervious clothing such as gloves, apron, boots, coveralls.

**DISPOSAL INFORMATION****Aquatic Toxicity**

Bromacil Technical

72 hour LC50, Rainbow Trout: 38 ppm

(continued)

**DISPOSAL INFORMATION** (continued)

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**Spill, Leak, or Release**

NOTE: Review FIRE AND EXPLOSION HAZARDS and SAFETY PRECAUTIONS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up. Dike spill. Prevent liquid from entering sewers, waterways or low areas. Soak up with sawdust, sand, oil dry or other absorbent material.

If spill area is on ground near valuable plants or trees, remove top 2 inches of soil after initial cleanup.

**Waste Disposal**

Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Do not flush to surface water or sanitary sewer system.

Triple rinse (or equivalent) the container. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by State and Local authorities, by burning.

**SHIPPING INFORMATION****DOT**

Proper Shipping Name

NOT REGULATED BY D.O.T.

Freight Class

HERBICIDE PREPARATIONS, OTHER

**DOT/IMO**

Proper Shipping Name

ETHANOL SOLUTION

Hazard Class

FLAMMABLE LIQUID, 3.3

UN No.

UN1170

DOT/IMO Label

FLAMMABLE LIQUID

Special Information

FLASHPOINT: 44 DEG C (110 DEG F)

**STORAGE CONDITIONS**

Store in well ventilated area. Keep container tightly closed. Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material.

**TITLE III HAZARD CLASSIFICATIONS**

Acute	Yes
Chronic	Yes
Fire	Yes
Reactivity	No
Pressure	No

(continued)

**TITLE III HAZARD CLASSIFICATIONS** (continued)**ADDITIONAL REGULATORY INFORMATION**

**SARA/CERCLA Reportable Quantity:**  
Methyl alcohol (5,000 lbs)

**RCRA Hazardous Waste:**  
Methanol (U154)

**REGULATORY CONTROLS:**  
"HYVAR" X-L Herbicide is registered under EPA/FIFRA regulations.

**EPA Reg. No. 352-346**

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

**Responsibility for MSDS:**

Du Pont  
Agricultural Products  
Registration & Regulatory Aff.  
Wilmington, DE 19898  
800-441-7515

# Indicates updated section.

**End of MSDS**

**AGENDA ITEM # 13****November 3, 1998**

**Consider authorizing advertising and setting date to open bids for vehicles and equipment for Unified Road System.**

Moved: Commissioner Boatright

Seconded: Judge Doerfler

Motion: To authorize advertising December 1, 1998 at 10:00 AM to open bids for vehicles and equipment for Unified Road System.

Vote: Motion carried 4 - 0

**WILLIAMSON COUNTY 1999 VEHICLE BID LIST**

- 1) 5 NEW HEAVY DUTY 3/4 TON WORK PICK UPS
- 2) 1 ONE TON DUAL REAR WHEEL CAB CHASSIS
- 3) 52,000 LB GVWR TRUCK TRACTOR
- 4) 33,000 LB GVWR WATER TANKER TRUCK
- 5) 12 TON TANDEM AXLE EQUIP HAUL TRAILER
- 6) TANDEM AXLE BOTTOM DUMP TRAILER
- 7) DOZER W/PAT BLADE AND REAR RIPPER(D-6 SIZE)
- 8) TRACK LOADER W/REAR RIPPER(953 SIZE)
- 9) SIDE MOUNT HYDRAULIC A-BOOM MOWER
- 10) BOMAG RECYCLER ROTOR UNIT REPLACEMENT